



General

Guideline Title

Undifferentiated vaginal bleeding/abdominal pain suggestive of ectopic pregnancy clinical pathway.

Bibliographic Source(s)

Undifferentiated vaginal bleeding/abdominal pain suggestive of ectopic pregnancy clinical pathway. Portland (ME): Maine Medical Center, Department of Emergency Medicine; 2011 Sep 7. 5 p.

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Emergency Medicine Quality Council. Undifferentiated vaginal bleeding/abdominal pain suggestive of ectopic pregnancy clinical pathway. Portland (ME): Maine Medical Center, Department of Emergency Medicine; 2006 Aug. 5 p.

Recommendations

Major Recommendations

The major recommendations for the emergency department management of women of childbearing age presenting with undifferentiated vaginal bleeding and/or abdominal pain suggestive of ectopic pregnancy are provided in the form of an algorithm, "Undifferentiated Vaginal Bleeding/Abdominal Pain Suggestive of Ectopic Pregnancy Clinical Pathway."

The grades of the strength and consistency of evidence (A1, A2, B1, B2, C1, C2, D) are defined at the end of the "Major Recommendations" field.

Definitions

Quantitative beta human chorionic gonadotropin (beta-hCG): expressed in mIU/mL per the World Health Organization Third International Standard (International Reference Preparation)

Clinical Evaluation

Data suggest that women with normal intrauterine pregnancies rarely experience pain or vaginal bleeding at below-threshold beta-hCG levels (1,000, 1,500, or 2,000 mIU/mL) and that women who do present to the emergency department (ED) with pain and/or vaginal bleeding and low beta-hCG levels are much more likely to have ectopic or abnormal intrauterine pregnancies (Kohn et al., 2003; Promes & Nobay, 2010). Therefore, a conservative approach to the evaluation of women of childbearing age presenting to the ED with abdominal pain and/or vaginal bleeding suggestive of ectopic pregnancy has been adopted.

- Women of childbearing age presenting to the ED with abdominal pain and/or vaginal bleeding will receive a urine test for pregnancy at triage ("Clinical policy," 2000; Evidence Grade = B1).
- Women with positive urine pregnancy tests who have not previously had an intrauterine pregnancy document by ultrasound will receive quantitative beta-hCG testing and a formal endovaginal ultrasound (Stein et al., 2010; McRae, Murray, & Emonds, 2009; Adhikari, Blaivas, & Lyon, 2007; Bloch, Baumann, & Strout, 2006; Dart, Kaplan, & Cox, 1997; Kaplan et al., 1996. Evidence Grade = A1).
- Women with vaginal bleeding will also undergo blood type and screen for Rh as well as hematocrit evaluation (Promes & Nobay, 2010; Royal College of Obstetricians and Gynaecologists, 2004; "Clinical policy," 2003. Evidence Grade = B1).
- Endovaginal ultrasound will not be dependent upon beta-hCG level (Promes & Nobay, 2010; Adhikari, Blaivas, & Lyon, 2007; Silva et al., 2006; Kohn et al., 2003; Gracia & Barnhart, 2001. Evidence Grade = B2)
- For women without intrauterine pregnancy observed by endovaginal ultrasound, an Obstetrics/Gynecology consult will be obtained (Promes & Nobay, 2010; Murray et al., 2005; Tayal, Cohen, & Norton, 2004. Evidence Grade = D).

General Considerations

- Always consider the possibility of heterotopic gestation, particularly in women who have utilized assisted reproductive technologies such as in vitro fertilization or gamete intrafallopian transfer (Promes & Nobay, 2010; Barnhart, 2009; Dimitry et al., "Heterotopic pregnancy," 1990; Dimitry et al., "Nine cases," 1990; Molloy et al., 1990. Evidence Grade = D).
- For women who have conceived naturally, the presence of an intrauterine pregnancy makes the likelihood of ectopic pregnancy extremely rare as the incidence of heterotopic gestation has been reported to be between 1 in 4,000 and 1 in 8,000 (Stein et al., 2010; Barnhart, 2009; Hann, Bachman, & McArdle, 1984; Reece et al., 1983; Bello et al., 1986; van Dam, Vanderheyden, & Uyttenbroeck, 1988; Vanderheyden & van Dam, 1987. Evidence Grade = D).
- It should be noted that several studies have shown a prevalence of normal ultrasound examination in 5% to 27% of women who actually have ectopic pregnancy (Stabile, Campbell, & Grudzinskas, 1988; Mahoney et al., 1985; Nyberg et al., 1987. Evidence Grade = C1).

Definitions:

Evidence Grading

A1 = Evidence from well-designed meta-analysis or well-done systematic review with results that consistently support a specific action

A2 = Evidence from one or more randomized controlled trials with consistent results

B1 = Evidence from high-quality evidence-based practice guideline

B2 = Evidence from one or more quasi-experimental studies with consistent results

C1 = Evidence from observational studies with consistent results (e.g., correlational, descriptive studies)

C2 = Inconsistent evidence from observational studies or controlled trials

D = Evidence from expert opinion, multiple case reports, or national consensus reports

Clinical Algorithm(s)

A clinical algorithm (clinical pathway) is provided in the original guideline document for undifferentiated vaginal bleeding/abdominal pain suggestive of ectopic pregnancy.

Scope

Disease/Condition(s)

Ectopic pregnancy

Guideline Category

Diagnosis

Evaluation

Screening

Clinical Specialty

Emergency Medicine

Obstetrics and Gynecology

Radiology

Intended Users

Advanced Practice Nurses

Nurses

Physician Assistants

Physicians

Guideline Objective(s)

To present a clinical pathway for the evaluation of women of childbearing age who present to the emergency department with abdominal pain and/or vaginal bleeding suggestive of ectopic pregnancy

Target Population

Women of childbearing age with abdominal pain and/or vaginal bleeding suggestive of ectopic pregnancy

Interventions and Practices Considered

1. Screening with urine pregnancy test
2. Quantitative beta-human chorionic gonadotropin (beta-hCG) serum testing
3. Transvaginal ultrasound
4. Blood typing and screening for Rhesus factor (Rh)
5. Serum hematocrit testing
6. RhoGAM [Rho(D) immune globulin] for Rh-negative patients
7. Prescription of prenatal vitamins
8. Referral to specialists as necessary

Major Outcomes Considered

Risk factors associated with ectopic pregnancy
Sensitivity and specificity of diagnostic tests
Incidence of heterotopic pregnancy

Methodology

Methods Used to Collect/Select the Evidence

Hand-searches of Published Literature (Primary Sources)

Hand-searches of Published Literature (Secondary Sources)

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

The MEDLINE and CINAHL databases and the Cochrane Library were used to conduct a literature search to locate relevant articles. The search was restricted to articles published in the English language. Priority was given to articles reporting results of original research although review articles, case reports, and commentaries were also reviewed. The last search was on August 22, 2011, and went from 1946 to that week for Medline, from 2005 to July 2011 for Cochrane, and from 1980 to 2011 for CINAHL.

Hand searches of relevant journals were conducted to locate relevant articles. Hand searches of the references of relevant articles were conducted to locate related articles.

Number of Source Documents

Not stated

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

A1 = Evidence from well-designed meta-analysis or well-done systematic review with results that consistently support a specific action

A2 = Evidence from one or more randomized controlled trials with consistent results

B1 = Evidence from high-quality evidence-based practice guideline

B2 = Evidence from one or more quasi-experimental studies with consistent results

C1 = Evidence from observational studies with consistent results (e.g., correlational, descriptive studies)

C2 = Inconsistent evidence from observational studies or controlled trials

D = Evidence from expert opinion, multiple case reports, or national consensus reports

Methods Used to Analyze the Evidence

Systematic Review

Description of the Methods Used to Analyze the Evidence

Not stated

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

This guideline was developed from a systematic review and synthesis of current evidence on ectopic pregnancy. Research findings and other evidence, such as guidelines, clinical policies, and standards from professional organizations, case reports, and expert opinion, were critiqued, analyzed, and used as supporting evidence.

Rating Scheme for the Strength of the Recommendations

Not applicable

Cost Analysis

A formal cost analysis was not performed and published cost analyses were not reviewed.

Method of Guideline Validation

Peer Review

Description of Method of Guideline Validation

This guideline was reviewed by experts knowledgeable of research on ectopic pregnancy and guideline development.

Evidence Supporting the Recommendations

References Supporting the Recommendations

Adhikari S, Blaivas M, Lyon M. Diagnosis and management of ectopic pregnancy using bedside transvaginal ultrasonography in the ED: a 2-year experience. *Am J Emerg Med.* 2007 Jul;25(6):591-6. [PubMed](#)

Barnhart KT. Clinical practice. Ectopic pregnancy. *N Engl J Med.* 2009 Jul 23;361(4):379-87. [54 references] [PubMed](#)

Bello GV, Schonholz D, Moshirpur J, Jeng DY, Berkowitz RL. Combined pregnancy: the Mount Sinai experience. *Obstet Gynecol Surv.* 1986 Oct;41(10):603-13. [PubMed](#)

Bloch RB, Baumann MR, Strout TD. The relationship between quantitative beta-human chorionic gonadotropin levels and ectopic pregnancy in an emergency department cohort. 2006.

Clinical policy: critical issues for the initial evaluation and management of patients presenting with a chief complaint of nontraumatic acute abdominal pain. *Ann Emerg Med.* 2000 Oct;36(4):406-15. [PubMed](#)

Clinical policy: critical issues in the initial evaluation and management of patients presenting to the emergency department in early pregnancy. *Ann Emerg Med.* 2003 Jan;41(1):123-33. [66 references] [PubMed](#)

Dart RG, Kaplan B, Cox C. Transvaginal ultrasound in patients with low beta-human chorionic gonadotropin values: how often is the study diagnostic. *Ann Emerg Med.* 1997 Aug;30(2):135-40. [PubMed](#)

Dimitry ES, Oskarsson T, Margara R, Winston RM. Heterotopic pregnancy associated with assisted reproductive technology. *Am J Obstet Gynecol.* 1990 Jul;163(1 Pt 1):244-5. [PubMed](#)

Dimitry ES, Subak-Sharpe R, Mills M, Margara R, Winston R. Nine cases of heterotopic pregnancies in 4 years of in vitro fertilization. *Fertil Steril.* 1990 Jan;53(1):107-10. [PubMed](#)

Gracia CR, Barnhart KT. Diagnosing ectopic pregnancy: decision analysis comparing six strategies. *Obstet Gynecol.* 2001 Mar;97(3):464-70. [PubMed](#)

Hann LE, Bachman DM, McArdle CR. Coexistent intrauterine and ectopic pregnancy: a reevaluation. *Radiology.* 1984 Jul;152(1):151-4. [PubMed](#)

Kaplan BC, Dart RG, Moskos M, Kuligowska E, Chun B, Adel Hamid M, Northern K, Schmidt J, Kharwadkar A. Ectopic pregnancy: prospective study with improved diagnostic accuracy. *Ann Emerg Med.* 1996 Jul;28(1):10-7. [PubMed](#)

Kohn MA, Kerr K, Malkevich D, O'Neil N, Kerr MJ, Kaplan BC. Beta-human chorionic gonadotropin levels and the likelihood of ectopic pregnancy in emergency department patients with abdominal pain or vaginal bleeding. *Acad Emerg Med.* 2003 Feb;10(2):119-26. [PubMed](#)

Mahony BS, Filly RA, Nyberg DA, Callen PW. Sonographic evaluation of ectopic pregnancy. *J Ultrasound Med.* 1985 May;4(5):221-8. [PubMed](#)

McRae A, Murray H, Edmonds M. Diagnostic accuracy and clinical utility of emergency department targeted ultrasonography in the evaluation of first-trimester pelvic pain and bleeding: a systematic review. *CJEM.* 2009 Jul;11(4):355-64. [31 references] [PubMed](#)

Molloy D, Deambrosis W, Keeping D, Hynes J, Harrison K, Hennessey J. Multiple-sited (heterotopic) pregnancy after in vitro fertilization and gamete intrafallopian transfer. *Fertil Steril.* 1990 Jun;53(6):1068-71. [PubMed](#)

Murray H, Baakdah H, Bardell T, Tulandi T. Diagnosis and treatment of ectopic pregnancy. *CMAJ.* 2005 Oct 11;173(8):905-12. [60 references] [PubMed](#)

Nyberg DA, Mack LA, Jeffrey RB Jr, Laing FC. Endovaginal sonographic evaluation of ectopic pregnancy: a prospective study. *AJR Am J Roentgenol.* 1987 Dec;149(6):1181-6. [PubMed](#)

Promes SB, Nobay F. Pitfalls in first-trimester bleeding. *Emerg Med Clin North Am.* 2010 Feb;28(1):219-34. [PubMed](#)

Reece EA, Petrie RH, Sirmans MF, Finster M, Todd WD. Combined intrauterine and extrauterine gestations: a review. *Am J Obstet Gynecol.* 1983 Jun 1;146(3):323-30. [62 references] [PubMed](#)

Royal College of Obstetricians and Gynaecologists (RCOG). The management of tubal pregnancy. London (UK): Royal College of Obstetricians and Gynaecologists (RCOG); 2004 May. 10 p. (Guideline; no. 21). [60 references]

Silva C, Sammel MD, Zhou L, Gracia C, Hummel AC, Barnhart K. Human chorionic gonadotropin profile for women with ectopic pregnancy. *Obstet Gynecol.* 2006 Mar;107(3):605-10. [PubMed](#)

Stabile I, Campbell S, Grudzinskas JG. Can ultrasound reliably diagnose ectopic pregnancy. Br J Obstet Gynaecol. 1988 Dec;95(12):1247-52. [PubMed](#)

Stein JC, Wang R, Adler N, Boscardin J, Jacoby VL, Won G, Goldstein R, Kohn MA. Emergency physician ultrasonography for evaluating patients at risk for ectopic pregnancy: a meta-analysis. Ann Emerg Med. 2010 Dec;56(6):674-83. [PubMed](#)

Tayal VS, Cohen H, Norton HJ. Outcome of patients with an indeterminate emergency department first-trimester pelvic ultrasound to rule out ectopic pregnancy. Acad Emerg Med. 2004 Sep;11(9):912-7. [PubMed](#)

van Dam PA, Vanderheyden JS, Uyttenbroeck F. Application of ultrasound in the diagnosis of heterotopic pregnancy--a review of the literature. J Clin Ultrasound. 1988 Mar-Apr;16(3):159-65. [70 references] [PubMed](#)

Vanderheyden JS, Van Dam PA. The rising incidence of heterotopic pregnancy: two case reports. Eur J Obstet Gynecol Reprod Biol. 1987 Apr;24(4):341-6. [PubMed](#)

Type of Evidence Supporting the Recommendations

The type of supporting evidence is identified and graded for each recommendation (see the "Major Recommendations" field).

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

- Prevention of undetected ectopic pregnancy
- Prevention of ruptured ectopic pregnancy
- Decreased morbidity and mortality associated with ectopic pregnancy

Potential Harms

Discomfort associated with phlebotomy
Infection risk associated with phlebotomy
Invasive nature of endovaginal ultrasound

Qualifying Statements

Qualifying Statements

This evidence-based clinical pathway is only a guide. It is highly recommended that all hospital emergency departments develop a plan for the evaluation of women at risk for ectopic pregnancy based upon available resources. Variations in practice may be warranted based on the needs of the individual patient, resources, and limitations unique to the institution or practice setting.

This (algorithm) tool is intended to be a reference for clinicians caring for patients with undifferentiated vaginal bleeding or abdominal pain suspicious for ectopic pregnancy and is not intended to replace providers' clinical judgment. Some clinical problems may not be adequately addressed by this reference. Always assess for other causes of abdominal pain.

Implementation of the Guideline

Description of Implementation Strategy

The guideline developer's implementation strategy includes:

- Educational sessions on clinical pathway implementation
- Distribution of the clinical pathway to all emergency physicians and nurses
- Distribution of the clinical pathway to all radiology physicians and staff

Implementation Tools

Clinical Algorithm

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Getting Better

IOM Domain

Effectiveness

Timeliness

Identifying Information and Availability

Bibliographic Source(s)

Undifferentiated vaginal bleeding/abdominal pain suggestive of ectopic pregnancy clinical pathway. Portland (ME): Maine Medical Center, Department of Emergency Medicine; 2011 Sep 7. 5 p.

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2006 Aug (revised 2011 Sep)

Guideline Developer(s)

Maine Medical Center, Department of Emergency Medicine - Hospital/Medical Center

Source(s) of Funding

Maine Medical Center, Department of Emergency Medicine

Guideline Committee

Emergency Medicine Quality Council: Ectopic Pregnancy Workgroup

Composition of Group That Authored the Guideline

Work Group Members: Rebecca B. Bloch, MD, Attending Physician Emergency Medicine and Director of Women's Health Emergency Medicine; Michael R. Baumann, MD, Vice Chair and Medical Director Emergency Medicine; Samir A. Haydar, DO, MPH, Attending Physician Emergency Medicine; George L. Higgins, III, MD, Director of Research Emergency Medicine; Jeffrey A. Holmes, MD, Attending Physician Emergency Medicine; Christine B. Irish, MD, Director of Emergency Ultrasound; Tania D. Strout, PhD, RN, MS, Associate Director of Research Emergency Medicine

Financial Disclosures/Conflicts of Interest

Not stated

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Emergency Medicine Quality Council. Undifferentiated vaginal bleeding/abdominal pain suggestive of ectopic pregnancy clinical pathway. Portland (ME): Maine Medical Center, Department of Emergency Medicine; 2006 Aug. 5 p.

Guideline Availability

Electronic copies: Available from the [Maine Medical Center, Department of Emergency Medicine Web site](#) .

Print copies: Available from Maine Medical Center Department of Emergency Medicine Research Office, 47 Bramhall Street, Portland, ME 04102. Telephone (207) 662-7049. Contact: Tania D. Strout, PhD, RN, MS at strout@mmc.org.

Availability of Companion Documents

None available

Patient Resources

None available

NGC Status

This NGC summary was completed by ECRI on December 8, 2006. The information was verified by the guideline developer on December 12, 2006. This NGC summary was updated by ECRI Institute on March 19, 2012. The updated information was verified by the guideline developer on March 27, 2012.

Copyright Statement

This NCG summary is based on the original guideline, which is subject to the guideline developer's copyright restrictions.

Disclaimer

NGC Disclaimer

The National Guideline Clearinghouse[®] (NGC) does not develop, produce, approve, or endorse the guidelines represented on this site.

All guidelines summarized by NGC and hosted on our site are produced under the auspices of medical specialty societies, relevant professional associations, public or private organizations, other government agencies, health care organizations or plans, and similar entities.

Guidelines represented on the NGC Web site are submitted by guideline developers, and are screened solely to determine that they meet the NGC Inclusion Criteria which may be found at <http://www.guideline.gov/about/inclusion-criteria.aspx>.

NGC, AHRQ, and its contractor ECRI Institute make no warranties concerning the content or clinical efficacy or effectiveness of the clinical practice guidelines and related materials represented on this site. Moreover, the views and opinions of developers or authors of guidelines represented on this site do not necessarily state or reflect those of NGC, AHRQ, or its contractor ECRI Institute, and inclusion or hosting of guidelines in NGC may not be used for advertising or commercial endorsement purposes.

Readers with questions regarding guideline content are directed to contact the guideline developer.